

U.S. FISH AND WILDLIFE SERVICE SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

Scientific Name:

Tamias minimus atristriatus

Common Name:

Penasco least chipmunk

Lead region:

Region 2 (Southwest Region)

Information current as of:

06/21/2012

Status/Action

☐ Funding provided for a proposed rule. Assessment not updated.

☐ Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

☒ New Candidate

☐ Continuing Candidate

☐ Candidate Removal

☐ Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status

☐ Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species

☐ Range is no longer a U.S. territory

☐ Insufficient information exists on biological vulnerability and threats to support listing

☐ Taxon mistakenly included in past notice of review

☐ Taxon does not meet the definition of "species"

☐ Taxon believed to be extinct

☐ Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

X Petitioned - Date petition received: 10/05/2011

90-Day Positive:

12 Month Positive:

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing?
Yes

Explanation of why precluded:

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, the majority of our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements; meeting statutory deadlines for petition findings or listing determinations; emergency listing evaluations and determinations; and essential litigation-related administrative and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of Progress on Revising the Lists, in the current CNOR which can be viewed on our Internet website (<http://endangered.fws.gov/>).

Historical States/Territories/Countries of Occurrence:

- **States/US Territories:** New Mexico
- **US Counties:** Lincoln, NM, Otero, NM
- **Countries:** United States

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories:** New Mexico
- **US Counties:** Lincoln, NM, Otero, NM
- **Countries:** United States

Land Ownership:

Occupied habitat has not been quantified, but is located within the high-elevation talus slopes of the Mescalero Apache Reservation and the Lincoln National Forest. Additional potentially suitable habitat may

be present on Mescalero Apache Reservation within ponderosa pine (*Pinus ponderosa*) forests of the Elk and Tularosa Valleys (Frey and Boykin 2007, pp. 16, 40; Sullivan 1993, pp. 2-3).

Lead Region Contact:

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Biological Information

Species Description:

The Peñasco least chipmunk is grayish-brown mixed with cinnamon-buff on the rump and thighs (Sullivan 1993, p. 1). The Peñasco least chipmunk has pale yellowish orange hindfeet, a light beige, yellowish, or orange belly, and dark underfur (Frey 2010, p. 11). The gray-footed chipmunk (*Tamias canipes*) occurs with the similar Peñasco least chipmunk and they are easily confused in the field (New Mexico Department of Game and Fish (NMDGF) 2008, p. 1). Frey reported that these species can be difficult to distinguish without physically comparing specimens (Frey 2007, p. 17). Specimens of the Peñasco least chipmunk from the Sacramento Mountains had a mean body length of 11.4 centimeters (cm) a mean tail length of 9.3 cm (3.7 in), a mean ear length of 1.4 cm (0.6 in), and a mean hindfoot length of 3 cm (1.2 in) (Frey 2010, p. 7). An identification Key for the subspecies is provided in Frey (2007).

Taxonomy:

The Peñasco least chipmunk was originally described as a distinct species (*Eutamias atristriatus*) based on specimens collected in 1902 (Bailey 1913, pp. 129-130). In a revision of the North American chipmunks, Howell (1929) reclassified the Peñasco least chipmunk as *Tamias minimus atristriatus*. *Tamias minimus atristriatus* is genetically distinct from other subspecies of least chipmunk (Sullivan and Petersen 1988, p. 21) and is recognized as a valid subspecies (Wilson and Reeder 2005).

Habitat/Life History:

The least chipmunks, *Tamias minimus*, have the largest geographic range of any North American chipmunk and occur in a variety of habitats from the boreal coniferous forest zone of Canada and eastern Alaska south through the Rocky Mountain region (Verts and Carraway 2001). Throughout this wide range, least chipmunks use a variety of habitats. However, some populations are locally specialized within disjunct areas and have evolved morphological, physiological, or behavioral adaptations to local environments (Frey and Boykin 2007, p. 10). The southernmost extent of *T. minimus* distribution includes isolated populations of the Peñasco least chipmunk, *Tamias minimus atristriatus*, within the White and Sacramento Mountains, New Mexico (Sullivan and Peterson 1988).

Least chipmunks often occupy non-forested habitats composed of shrubs, rocks, dense herbaceous vegetation, or forests with trees that lack low-hanging limbs (Frey and Boykin 2007, p. 10). Least chipmunks dig burrows for nesting, often under large rocks, but may also use tree cavities or other natural structures (Verts and Carraway 2001, pp. 6-7). They forage mainly on the ground or in shrubs (Hoffmeister 1986, p. 15). The seeds of shrubs and forbs are their main food source, though they also feed on arthropods, leaves, fruits, flowers, and fungi (Bailey 1931, p. 91; Vaughn 1974, pp. 770-772). The least chipmunk does not

develop fat deposits in the fall, but relies on brief periods of activity to consume cached food for survival over the winter (Verts and Carraway 2001). In spring, females typically produce one litter of 4-5 pups (Skryja 1974, p. 223). The average life span of the least chipmunk is 0.7 years (Erlien and Tester 1984, p. 2).

The Peñasco least chipmunk has been found in two different and distinctive habitat types in New Mexico: 1) the ponderosa pine forest zone in the Sacramento Mountains; and 2) high elevation talus slopes and glacial cirques surrounded by Englemann spruce (*Picea engelmanni*), quaking aspen (*Populus tremuloides*), corkbark fir (*Abies lasiocarpa*), and Douglas fir (*Pseudotsuga menziesii*) above treeline in the White Mountains (Frey and Boykin 2007, pp. 27-28; Sullivan 1993; p. 3). In the Sacramento Mountains, historic mature ponderosa pine forests have been described as lacking lower limbs and providing an open structure with dense grass cover (Frey and Boykin 2007, p. 51; USFS 2002, pp. Bii-Biii). The Sacramento Mountains population appears to have been nearly exclusively associated with large open mature stands of ponderosa pine forest, which have mostly been eliminated and subsequently replaced by dense coniferous stands of young trees that are unsuitable for the least chipmunk (Kaufmann et al. 1998; Frey and Boykin 2007, pp. 27, 51). In contrast, in the White Mountains, which are about 40 kilometers (km) (30 miles (mi)) north of the Sacramento Mountains, the least chipmunk has only been associated with patches of rock and talus above treeline within close proximity of Sierra Blanca Peak (Frey and Boykin 2007, p. 28).

Historical Range/Distribution:

The Peñasco least chipmunk (least chipmunk) (*Tamias* (= *Neotamias*) *minimus atristriatus*) is endemic to the White Mountains, Otero and Lincoln Counties, and the Sacramento Mountains, Otero County, New Mexico (Frey and Boykin 2007). The least chipmunk had a broad distribution throughout the Sacramento Mountains within ponderosa pine forests (Frey 2010, p. 18). The mature ponderosa pine forests were historically extensive along the gentle east slope of the Sacramento Mountains, forming open savannahs and park-like stands (Frey and Boykin 2007, p. 51; USFS 2002, p. Biii). In the Sacramento Mountains, the least chipmunk was abundant and widespread until the early 1930s (Frey and Boykin 2007, pp. 15, 50). The subspecies' habitat in the Sacramento Mountains has substantially changed and the least chipmunk appears to be extirpated from the Sacramento Mountains (Hope and Frey 2000 p. 10; Frey and Boykin 2007, pp. 12-18; Wampler 2007; Frey 2009, p. 5). The last verification of persistence of the Sacramento Mountains population of least chipmunk was in 1966 (Conley 1970, p. 699); however, there were unverified reports of the subspecies in the 1990s from the Sacramento Mountains, Otero County (Ward 2001; Frey and Boykin 2007, pp. 16-17).

Current Range Distribution:

The distribution and abundance of the least chipmunk has dramatically declined since the early 20th century (Frey and Boykin 2007, p. 50). Despite field surveys in 1981-1982, 1991-1996, 2000, and 2005-2006 (reviewed in Frey and Boykin 2007), the least chipmunk population within the Sacramento Mountains has not been verified since 1966. Although it is unknown whether the Sacramento Mountains population persists, most authors believe it has been extirpated (Hope and Frey 2000 p. 10; Frey and Boykin 2007, pp. 12-18, 50; Wampler 2007; Frey 2009, p. 5). From at least 1994, the Lincoln National Forest has reported that the subspecies no longer occurs on the Sacramento Ranger District within its historically occupied habitat (USFS 1993, p. 26; 2008, p. 31; 2011, p. 62).

The persistence of the White Mountain population of least chipmunk was last verified in 1998 and 2000 (Ortiz 1999; Hope and Frey 2000). The core of this population is likely associated with a large area of rocky habitat on Sierra Blanca Peak and probably extended to adjacent areas such as Buck Mountain on Forest Service lands (Frey and Boykin 2007, p. 50). The subalpine areas in the White Mountains likely contain suitable habitat for the least chipmunk because this area has remained relatively unaltered from historic conditions (Frey and Boykin 2007, p. 40).

Population Estimates/Status:

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

The Peñasco least chipmunk has been found in two different and distinctive habitat types: 1) ponderosa pine forests in the Sacramento Mountains; and 2) subalpine, rocky areas above the treeline in the White Mountains (Frey and Boykin 2007, pp. 27-28). Several historic and current threats related to habitat in the Sacramento Mountains have been identified, including alteration or elimination of mature ponderosa pine forests and associated savannahs, residential development, fire exclusion and suppression, and potentially livestock grazing. We have found no information to substantiate similar threats within the White Mountains (Frey and Boykin 2007, pp. 51-52). In fact, the habitat in the White Mountains is apparently relatively unaltered from that found historically (Frey and Boykin 2007, p. 40).

Alteration or loss of mature ponderosa pine forests. The single greatest cause of decline of the Peñasco least chipmunk in the Sacramento Mountains is the loss, alteration, and fragmentation of mature ponderosa pine forests (Frey and Boykin 2007, p. 51). Unlike much of New Mexico, the Sacramento Mountains were not occupied by humans intensively until the late 1800s (Kaufmann et al. 1998, p. 68). Therefore, settlers and explorers from the 1880s to about 1900 found the ponderosa pine forests open-canopied and park-like, very close to a natural state, as it had likely existed for centuries (USFS 2002, pp. 1.17-1.18). However, after 1900, human settlement and the associated logging, grazing, and development quickly altered forests over much of the mountain range (Kaufmann et al. 1998, p. 68; USFS 2002, p. 1.18). Grazing, fire suppression, and timber harvest in the Sacramento Mountains, especially in the areas east of the Village of Cloudcroft, changed forest stand structure and stand composition, resulting in a landscape that is now dominated by densely-stocked, small-diameter coniferous trees that have a high potential for insect infestations or stand-replacing fires (USFS 2002, pp. 1.18, 3.22, Bii-Bv).

Alexander et al. (1984, p. 14) reported that logging removed all mature ponderosa pine trees in the mountain range. For example, much of the ponderosa pine forests in the James Canyon and other areas in Sacramento Mountains were logged between 1900 and 1940 (Glover 1984; Kaufmann et al. 1998, p. 48). These actions effectively fragmented and isolated suitable habitat to the point where the species could no longer persist. With the exception of some small areas, none of the historic open ponderosa pine forests with large diameter trees remain in the White and Sacramento Mountains (Kaufmann et al. 1998, p. 68; USFS 2002, p. 3.9). Many of the historic ponderosa pine forest stands currently have a few large, old, fire-scarred ponderosa pines in the overstory, surrounded by dense young Douglas-fir, white fir (*Abies concolor*), and Gambel oak (*Quercus gambelii*), or young dense stands of ponderosa pine (Kaufmann et al. 1998; USFS 2002, pp. Bii-Bv), which are unsuitable for the least chipmunk, but suitable for the gray-footed chipmunk (Frey and Boykin 2007, p. 51). The gray-footed chipmunk, a potential competitor, currently is abundant in James Canyon and areas throughout the Sacramento Mountains (Sullivan 1993, p. 4; Hope and Frey 2000, Appendix 1; Frey and Boykin 2007, pp. 16-18) (see Factor E for additional discussion).

Current forests in the Sacramento Mountains also lack the formerly productive herbaceous understory that was dominated by grasses, forbs, and shrubs (Covington et al. 1997, p. 23) that provided habitat and food for the least chipmunk. These changes in vegetation structure and composition continue to favor species such as the gray-footed chipmunk that are dependent on dense forests with heavy canopy cover and little to no herbaceous understory (Covington and Moore 1992, pp. 92-93).

As a result of the historic loss and alteration of ponderosa pine forests in the Sacramento Mountains, the distribution of the least chipmunk has been reduced to one remaining population in the White Mountains.

This remaining population is likely subject to impacts from small, reduced population sizes and stochastic, catastrophic events (see Factor E).

Residential development. The least chipmunk population in the White Mountains is not currently threatened by residential development. In the Sacramento Mountains, however, the subspecies' habitat has been altered by development associated with private lands in James Canyon. This area includes the Village of Cloudcroft, the Cloudcroft ski area, several developed Forest Service campgrounds, and many private homes in James Canyon along highway 82 (Kaufmann et al. 1998, p. 46). The James Canyon area historically supported more stands of pure ponderosa pine than any other area on the Lincoln National Forest (Kaufmann et al. 1998, p. 46). Residential development of private land continues to fragment the small areas of remnant least chipmunk habitat within the Sacramento Mountains. For example, the ponderosa pine habitat and agricultural fields with intervening fence-rows found during the early 20th Century have all been replaced by intense residential development (NMDGF 2008, p. 2). The human population in James Canyon and surrounding areas has increased to several thousand residents over the last several decades (USFS 1999, p. 3; 2000 p. 43). This area is now the most heavily developed part of the Sacramento Mountains with developed campgrounds, a ski area, and many summer and year-round homes (Kaufmann et al. 1998, pp. 46, 48).

Development activities within James Canyon and other surrounding areas in the Sacramento Mountains will continue to destroy or modify areas that potentially could be restored for use by the subspecies. Further, the extensive fragmentation of the historic habitat within the Sacramento Mountains and the isolation of this area from the extant Sierra Blanca locality (separated by 40 kilometers (km) (30 miles (mi))) indicates that natural recolonization of the Sacramento Mountains by the Peñasco least chipmunk is highly unlikely. For these reasons, we do not anticipate that historic habitat within the Sacramento Mountains can be restored to an open, mature ponderosa pine forest that will be naturally recolonized by the least chipmunk in the foreseeable future.

Any Peñasco least chipmunk localities that may still be extant, but undocumented, within the Sacramento Mountains would be highly susceptible to extirpation as a result of these current and future impacts to least chipmunk habitat. We conclude that continuing residential development of private land has the potential to degrade or eliminate any remnant habitat within the foreseeable future, and therefore further contribute to the decline of the status of the subspecies.

Fire exclusion and suppression. The exclusion of high-frequency, low-intensity fires in the Sacramento Mountains has altered the natural fire behavior (Alexander et al. 1984, pp. 14-15). Over 1,000 years, lower intensity ground fires occurred every 4 to 5 years and shaped and perpetuated the woodlands and forests of the mountain range (USFS 2002, pp. 1.18, 3.17). The loss of herbaceous vegetation in the understory of ponderosa pine forests resulted in a lack of fine fuels to carry high-frequency, low-intensity fires that naturally killed seedlings and maintained open savannahs. The Forest Service's fire management strategy of prevention, detection, and suppression resulted in virtually all of the ponderosa pine stands developing multistoried forest structure that is detrimental to and not used by the least chipmunk (USFS 2002, p. 3.23). In the absence of frequent surface fires, remaining potential habitat of the Peñasco least chipmunk that was historically dominated by open ponderosa pine savannahs with understory grasses and forbs are now filled with dense in-growth of Douglas-fir and white fir (Kaufmann et al. 1998, pp. 68-69; Allen et al. 2002, p. 1420). These changes have also resulted in a shift of foraging habitat favoring those species, such as the gray-footed chipmunk, that thrive in dense forests (Covington and Moore 1992, p. 92). In fact, early descriptions of the gray-footed chipmunk report that it was uncommon in open ponderosa pine and largely a forest animal, inhabiting dense mixed conifer habitat (Frey and Boykin 2007, Table 4; Bailey 1931, p. 87). Populations of the gray-footed chipmunk have expanded in response to the increase of densely-stocked mixed conifer forests (Frey and Boykin 2007, Table 4).

Fire exclusion, and the resulting overstocked, dense forests has also significantly increased the potential for high-intensity, destructive crown fires (Covington and Moore 1992, p. 94; Allen et al. 2002, p. 1420). In fact, since 1921, seven large stand-replacing type fires have occurred in the area east of the Village of Cloudcroft

that historically contained habitat of the least chipmunk (USFS 2002, p. 3.18). Five of these fires have burned since 1993 (USFS 2002, p. 3.18). Within the watersheds that historically supported the least chipmunk in the Sacramento Mountains, 94 percent of the area is highly susceptible to stand-replacing fires (USFS 2002, p. 3.20). For these reasons, we conclude that continued exclusion and suppression of fire is likely to further curtail the range of the subspecies by preventing restoration of ponderosa pine and increasing the risk of high-intensity fire. The continued implementation of the Forest Service's strategy of fire suppression and exclusion is likely to remove and effectively eliminate, degrade, or fragment the remaining potential habitat of the least chipmunk in the Sacramento Mountains.

Livestock grazing. Grazing also contributed to the altered composition of ponderosa pine forests in the Sacramento Mountains, particularly in James Canyon, which has been heavily overgrazed (Alexander et al. 1984, p.16; Sullivan et al. undated, p. 2). Overgrazing, drought, and erosion eliminated continuous stretches of grass that would have historically carried surface fires necessary for maintaining the open ponderosa pine habitat utilized by the least chipmunk. As a result, overgrazing contributed to the risk of high-intensity fire in the Sacramento Mountains.

Minimal grazing by domestic livestock occurred historically in the upper elevations of the Lincoln National Forest in the vicinity of Sierra Blanca Peak and Buck Mountain in the White Mountains (Plummer and Gowsell 1904, pp. 18, 32; Dyer and Moffett 1999, p. 451). Dyer and Moffett (1999, p. 451) reported that from the 1940s to 1960s, the area in the vicinity of the Buck Mountain locality on the Lincoln National Forest received minimal grazing pressure from cattle. In 1964, White Mountain Wilderness status was conferred on the adjacent 19,533 hectare-area (48,266 acres) and all grazing halted (Dyer and Moffett 1999, p. 451). Currently, only dispersed recreation occurs within the White Mountain Wilderness, whereas Buck Mountain currently houses a communication tower and is also not grazed by livestock (USFS 1986, p. 80). Moreover, grazing by elk, which were reestablished in this area in 1965, does not appear to be excessive (Dyer and Moffett 1999, p. 451). We found no specific information to determine whether the subalpine grassland habitat adjacent to the talus slopes in the Sierra Blanca Peak area of the Mescalero Apache Reservation is currently grazed by livestock or if grazing threatens the least chipmunk habitat within this area.

B. Overutilization for commercial, recreational, scientific, or educational purposes:

We have no information indicating that the least chipmunk is being used for commercial, recreational, scientific, or educational purposes. Therefore, this factor is not a basis for concluding that a proposal to list the subspecies is appropriate.

C. Disease or predation:

We have no information regarding predation risk to the subspecies. Therefore, we cannot conclude that predation is a basis for determining that a proposal to list the least chipmunk is appropriate.

We currently have no specific information that indicates disease poses a substantial risk to the least chipmunk. Nevertheless, the plague bacterium (*Yersinia pestis*) is an invasive species that has colonized and significantly altered mammal communities, causing large population reductions throughout western North America (Biggins and Kosoy 2001). Plague relationships for many rodents in western North America are poorly understood (Biggins and Kosoy 2001, p. 913). However, Holdenried and Quan (1956, p. 981) found the least chipmunk (*T. minimus*) to be highly susceptible to plague bacteria. Plague may also interact synergistically with other threats, increasing the risk of extirpation or extinction of small mammals (Biggins and Kosoy 2001, p. 913). Moreover, Harrison et al. (2003, p. 721) reported the presence of fleas capable of carrying plague on foxes from counties throughout New Mexico, including Otero County. They also suggest

that plague might occur in every county of New Mexico (Harrison et al. 2003, p. 721). Although we have no specific information to indicate that the least chipmunk has been affected by plague, if there is an outbreak of plague, this bacterium could significantly impact the least chipmunk.

D. The inadequacy of existing regulatory mechanisms:

One primary cause of decline of the least chipmunk is the loss, degradation, and fragmentation of habitat. As described below, Federal and State laws have been insufficient to prevent past and ongoing losses of the habitat of the least chipmunk, and are unlikely to prevent further declines of the subspecies.

In 1983, the NMDGF listed the least chipmunk as endangered (NMDGF 1985, p. 120). This designation provides the protection of the New Mexico Wildlife Conservation Act, which prohibits direct take of the subspecies except under issuance of a scientific collecting permit. However, this only conveys protection from collection or intentional harm; no New Mexico State statutes address habitat protection, indirect effects, or other threats to the subspecies identified by the State as endangered. Because most of the risks to the least chipmunk are from effects to habitat, protecting individuals from direct take will not ensure long-term protection of the subspecies.

NMDGF has the authority to consider and recommend actions to mitigate potential adverse effects to the least chipmunk during its review of development proposals. As noted, NMDGF's primary regulatory authority is under the New Mexico Wildlife Conservation Act. There are no statutory requirements under NMDGF's jurisdiction that serve as an effective regulatory mechanism for reducing or eliminating the threats (see Factor A above) that may adversely affect the least chipmunk and its habitat. Although the New Mexico State statutes require the NMDGF to develop a recovery plan that will restore and maintain habitat for the subspecies, the subspecies does not have a finalized recovery plan, conservation plan, or conservation agreement (NMDGF 2006, p. 430). It is unknown whether the recovery plan will be completed in the near future.

Under the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*) and the National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*), the Forest Service is directed to prepare programmatic-level management plans to guide long-term resource management decisions. In addition, Forest Service planning regulations in place since 1986 when the Lincoln National Forest Plan was written, for the areas including least chipmunk habitat, included direction to manage habitat to maintain viable populations of existing native and desired nonnative vertebrate species in planning areas (36 CFR 219.19). These regulations resulted in the preparation of a land management plan by the Forest Service that addressed management and resource protection of areas that support, or in the past supported, populations of the least chipmunk. While the Lincoln National Forest is currently required to maintain or enhance the viability of species on this list by considering the least chipmunk in their project biological evaluations, we are not aware of any measures that have been implemented to protect or improve the status of the subspecies.

The Regional Forester's Sensitive Species List policy is applied to projects implemented under the 1982 National Forest Management Act Planning Rule. Since 1990, the least chipmunk has been designated as a sensitive species on the Lincoln National Forest under the 1986 Forest Plan and the 1982 Planning Rule (Forest Service 1999a). The intent of the sensitive species designation under the operative Forest Service planning rule is to provide a proactive approach to conserving species to prevent a trend toward listing under the Endangered Species Act and to ensure the continued existence of viable, well-distributed populations. In practice, the Forest Service has taken no actions to conserve or analyze and avoid impacts to the least chipmunk and its habitat (USFS 2002; 2002a, 2011b, p. 3). The Lincoln National Forest did not consider the least chipmunk in the analyses of at least two recent landscape-scale projects in the White Mountains immediately adjacent to the Buck Mountain location and within the range of the subspecies in Sacramento Mountains, including a large 65,154 ha (161,000 ac) project covering the entire historic range of the subspecies in the Sacramento Mountains (USFS 2002; 2002a, 2011b, p. 3).

On April 21, 2008, a new Forest Service planning rule (73 FR 21468) was finalized. However, on June 30, 2009, the United States District Court for the Northern District of California issued a decision in *Citizens for Better Forestry v. United States Department of Agriculture*, No. C 08-1927 CW (N.D. Cal. June 30, 2009) that enjoined the Forest Service from implementing and using the 2008 planning rule and remanded the matter to them for further proceedings. The Forest Service recently proposed a new planning rule to guide land and resource management planning for all units of the National Forest System under the National Forest Management Act of 1976 (USFS 2011a, 76 FR 8480). Until the new planning rule is finalized in 2013 and the Lincoln National Forest Plan is subsequently revised, the Forest will continue to operate under the 1982 rule (USFS 2012). For these reasons, we conclude that the current Lincoln National Forest Plan and 1982 planning rule have been inadequate to protect the least chipmunk. Nevertheless, even if protections were afforded to the subspecies due to its Forest Service sensitive-species status, the single extant population in the White Mountains is insufficient to conserve the Peñasco least chipmunk.

The Service and Tribes have a common goal of conserving sensitive species (including candidate, proposed, and listed species) and the ecosystems upon which they depend. Tribal lands are not federal public lands or part of the public domain, and are not subject to Federal public land laws. These lands are managed in accordance with Tribal goals and objectives, within the framework of applicable laws. We recognize Tribal sovereignty, Tribal rights, and the Federal trust responsibility as it applies to the Mescalero Apache Nation. We are not aware of any existing regulatory mechanisms that are afforded to the least chipmunk on their lands.

E. Other natural or manmade factors affecting its continued existence:

Climate Change. The Intergovernmental Panel on Climate Change (IPCC) states that warming of the climate system is unequivocal, based on observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (2007a, p. 5). For the next two decades, a warming of about 0.4 degrees Fahrenheit (°F) (0.2 degrees Celsius (°C)) per decade is projected (IPCC 2007a, p. 12). Temperature projections for the following years increasingly depend on specific emission scenarios (IPCC 2007a, p. 13). Various emissions scenarios suggest that average global temperatures are expected to increase by between 1.1 °F and 7.2 °F (0.6 °C and 4.0 °C) by the end of the 21st century, with the greatest warming expected over land (IPCC 2007a, p. 13). Warming in western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-allocated water resources (IPCC 2007b, p. 14). The IPCC reports that it is very likely that hot extremes, heat waves, and heavy precipitation and flooding will increase in frequency (IPCC 2007b, p. 18).

The southwestern United States may be entering a period of prolonged drought (McCabe et al. 2004, pp. 4137-4140). Rapid shifts in vegetation can take place in response to climate variation. During the 1950s, the ecotone between semiarid ponderosa pine forest and pinon-juniper woodland in the Jemez Mountains of New Mexico, shifted extensively (2 km or more) and rapidly (5 years) through mortality in response to a severe drought (Allen and Breshears 1998, p. 1). Although the information available on climate change indicates that New Mexico will be impacted (New Mexico Climate Change Advisory Group 2005, p. 1), there is no information specific to the effects of climate change on the least chipmunk or its habitat. Reliable predictive models have not been developed for use at the local scale, and there is little certainty regarding the timing and magnitude of the resulting impacts.

Any further reduction of ponderosa pine may be a threat to the least chipmunk in the Sacramento Mountains (Frey and Boykin 2007, p. 52). Moreover, in the White Mountains, any climate change that would promote tree growth to the exclusion of the current subalpine grassland would also threaten the least chipmunk (Frey and Boykin 2007, p. 52). We do not have evidence indicating that climate change is currently a significant factor affecting the least chipmunk's existence because the information available on the subject is

insufficiently specific to the subspecies or the possible current or future effects of climate change on least chipmunk habitat. However, we consider climate change to be a potential exacerbating factor and will continue to evaluate new information on the subject as it becomes available.

Competition/community shift. Competitive exclusion by other species of chipmunk or ground squirrels likely influences the distribution and habitat use of the least chipmunk (Carey 1978, pp. 206-207; Chappell 1978, p. 573; Heller 1971, p. 318). In forest and woodland habitats characterized by trees with branches close to the ground, least chipmunks are excluded by larger species (Frey and Boykin 2007, p. 10). Historic mature ponderosa pine forests that lacked lower limbs and had an open structure of the forest were ideal for the least chipmunk in the Sacramento Mountains. However, the current dense stands of Douglas fir and white fir in these areas are unsuitable for the least chipmunk, but entirely suitable for the gray-footed chipmunk (Frey and Boykin 2007, p. 51). Alternatively, the habitat has remained intact for the least chipmunk populations located in the White Mountains, but the gray-footed chipmunk appears to have also become more abundant since the 1950s (Frey and Boykin 2007, pp. 24-26, 40).

Specimen records of chipmunks collected in the Sacramento and White Mountains suggest a possible shift in the mammal community (Frey and Boykin 2007, pp. 25-26, 50). For example, surveys from the 1930s to 1960s collected many individuals of least chipmunk, but no gray-footed chipmunk (Frey and Boykin 2007, p. 50). Gray-footed chipmunk has become more common in this area since that time. In the 1980s, both species were collected on Sierra Blanca on the Mescalero Apache Indian Reservation (Frey and Boykin 2007, p. 50). Similarly, in 2007, individuals of gray-footed chipmunk were found on the adjacent talus of slopes of Buck Mountain on Forest Service lands (the last verified location of least chipmunk in 2000), but no individuals of least chipmunk were captured or observed (Frey and Boykin 2007, p. 47). The same shift from least chipmunk to gray-footed chipmunk occurred in the Sacramento Mountains, where, as noted above, the least chipmunk has likely been extirpated and the gray-footed chipmunk is locally abundant (Sullivan 1993, p. 4; Frey and Boykin 2007, pp. 25-26, 50). Still, this apparent community shift does not necessarily indicate that competition between the two species was the primary cause of local extirpations of the least chipmunk from either the Buck Mountain locality or throughout the Sacramento Mountains. Nevertheless, frequent reductions in the least chipmunk populations may create temporary conditions that could favor the gray-footed chipmunk (Sullivan et al. undated, p. 22). Additionally, small isolated populations of least chipmunk occupying restricted montane habitat may undergo frequent year-to-year population fluctuations (Sullivan et al. undated, p. 21). Based on this information, we consider competition and an apparent community shift to be a potential exacerbating factor and will continue to evaluate new information on the subject as it becomes available.

Small and reduced population size. The Peñasco least chipmunk is extremely rare and currently only known from one locality in the White Mountains, New Mexico (Frey and Boykin 2007, entire document). Surveys have not confirmed the existence of the subspecies in the Sacramento Mountains since 1966, whereas a marked decline in the number of individuals captured in the White Mountains has been observed. Based on our review of survey information, we conclude that the least chipmunk likely persists only above the treeline on or in the vicinity of Sierra Blanca Peak in the White Mountains, Lincoln and Otero Counties, where its habitat has remained relatively unaltered, but population sizes may be small (Frey and Boykin 2007, pp. 40, 50, 52). Over the last two decades, intensive surveys in the White Mountains have documented few individuals. For example, Sullivan (1993, p. 3; et al. undated, p. 17) reported that between 15 and 20 individuals of least chipmunk were observed on Sierra Blanca Peak within the White Mountains. Moreover, only one Peñasco least chipmunk was found on Buck Mountain in 1998, two individuals in 2000, and none were found in 2007 (Ortiz 1999; Hope and Frey 2000; Frey and Boykin 2007). Because the Peñasco least chipmunk only produces one litter per year, population growth is expected to be slow (Frey and Boykin 2007, p. 52). As such, this locality may not be self-sustaining in the long term (e.g., see Frey and Boykin 2007, p. 50).

The limited geographic range of the Peñasco least chipmunk is significantly reduced compared to historical times (Frey and Boykin 2007; Frey 2010), which is a major contributor to the vulnerability of this species

and increases the probability of extinction of the remaining isolated population within the White Mountains from any threat. Small populations are subject to extirpation from random variations in such factors as the demographics of age structure or sex ratio, and from disease and other natural events (Wilcox and Murphy 1985, pp. 879-887). The last documentation of the least chipmunk in the Sacramento Mountains was in 1966 (Conley 1970, p. 699), despite surveys for the subspecies during 1981–1982 (Sullivan et al. undated, pp. 22-23; Sullivan 1993, pp. 3-4), 2000 (Hope and Frey 2000, p. 7, Appendix 1), and 2007 (Frey and Boykin 2007; pp. 48-49). Specimen records and observations suggest that the Peñasco least chipmunk was abundant and widespread throughout the ponderosa pine zone of the Sacramento Mountains until the 1930s (Frey and Boykin 2007, p. 50). If any least chipmunk populations remain in the Sacramento Mountains, they are likely located on the Mescalero Apache Indian Reservation within the remnant ponderosa pine patches near the Elk or Tularosa Valleys (Sullivan et al. undated, p. 23; Frey and Boykin 2007, pp. 50, 52). Still, any such relicts of open ponderosa pine habitat would be extremely small and vulnerable to extirpation (Frey and Boykin 2007, p. 52). If the White Mountains population were extirpated for any reason, the species would likely be extinct since there are no other known sources of this species from which to recolonize. This situation makes the magnitude of impact of any possible threat very high. As a result, we conclude that the status of the subspecies appears to have declined to the point that it is highly vulnerable to extinction.

Isolation/fragmentation. Currently occupied habitat of the least chipmunk is geographically isolated and not contiguous with areas that historically contained the subspecies. The ponderosa pine areas within the Sacramento Mountains have been significantly altered and fragmented (Factor A above), whereas areas within the White Mountains that contain the remaining least chipmunk habitat are disjunct and geographically isolated. Because the White Mountains population is the only known extant location, it is particularly susceptible to extinction from any impact. For this reason, the survival of the least chipmunk is unlikely without additional habitat for population expansion or sufficient connectivity between areas to make re-occupancy possible, or both. Because the habitat adjacent to the extant White Mountains population is not contiguous and any relict populations are likely to be small, we expect that population expansion under current and future management is not possible or is highly unlikely. Moreover, any remaining potential habitat on the Mescalero Apache Reservation would also be isolated and separated by large areas of unsuitable habitat. As such, we expect that dispersal from the remaining populations of least chipmunk in the White Mountains to any remnant patches of habitat in the Sacramento Mountains is not possible or is highly unlikely with the currently fragmented or unsuitable habitat, indicating the subspecies is particularly vulnerable to extinction. This isolation and fragmentation is significant because areas that may be extirpated in the future due to any threat are unlikely to be repopulated by neighboring populations, thereby contributing to the further decline of the species.

Conservation Measures Planned or Implemented :

There are currently no conservation measures that are being planned or implemented for the Peñasco least chipmunk.

Summary of Threats :

The Peñasco least chipmunk faces threats from present or threatened destruction, modification, and curtailment of its habitat from the alteration or loss of mature ponderosa pine forests in one of the two historically-occupied areas. The subspecies is further threatened by residential development, fire suppression and exclusion, and high-intensity fire. In the Sacramento Mountains, we found that the subspecies' habitat requirements of open ponderosa pine forests have essentially been eliminated due to the historical impact of these activities. Ongoing impacts due to these activities continue to further degrade these habitats and further preclude recovery of these areas. Further, the existing regulatory mechanisms have not been adequate to prevent the continuing decline of the least chipmunk. The documented decline in occupied localities, in conjunction with the small numbers of individuals captured, are linked to widespread habitat alteration (Frey and Boykin 2007). Moreover, the highly-fragmented nature of its current distribution is a significant

contributor to the vulnerability of this subspecies and increases the likelihood of very small, isolated populations being extirpated (Factor E). As a result of this fragmentation, even if suitable habitat exists (or is restored) in the Sacramento Mountains, the likelihood of recolonization of historic habitat or population expansion from the White Mountains is extremely remote. Considering the magnitude and imminence of these threats to the subspecies and its habitat, and the vulnerability of the White Mountains population, we conclude that the least chipmunk is in danger of extinction throughout all of its known range now or in the foreseeable future.

We find that listing the Peñasco least chipmunk is warranted throughout its range. There is likely only one locality in the White Mountains that is extant. We therefore find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

_____ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions(PECE)?

Recommended Conservation Measures :

Ponderosa pine habitat restoration (e.g., following the principles outlined in Allen et al. 2002, pp. 1424-1428) and reintroductions of the subspecies in the Sacramento Mountains will be necessary before significant risk reduction for the Peñasco least chipmunk is possible.

Additional surveys should be conducted for the least chipmunk in the Sacramento and White Mountains, including private lands and the Mescalero Apache Nation.

A conservation strategy should be developed for the subspecies, to guide coordinated conservation efforts by multiple partners.

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/Population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotype genus	7
		Species	8
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

Magnitude:

The Peñasco least chipmunk is extremely rare and currently only known from one locality in the White Mountains, New Mexico (Frey and Boykin 2007, entire document). Surveys have not confirmed the existence of the subspecies in the Sacramento Mountains since 1966, whereas a marked decline in the number of individuals captured in the White Mountains has been observed. The historic habitat within the Sacramento Mountains has been fragmented or replaced by small diameter coniferous trees as a result of the cumulative effects of timber harvest, grazing, residential development, fire suppression, and high-intensity crown fires. These activities continue to occur in the Sacramento Mountains and make natural recolonization of the area very unlikely. The remaining population in the White Mountains is particularly susceptible to extinction as a result of small, reduced population sizes and its isolation. Because of the reduced population size and lack of contiguous habitat adjacent to the extant White Mountains population, even a small impact on the White Mountains could have a very large impact on the status of the species as a whole.

Imminence :

As a result of its restricted range, apparent small population size, and fragmented historical habitat, the one known remaining extant population in the White Mountains is inherently vulnerable to extinction due to effects of small, population sizes. These impacts are likely to be seen in the population at some point in the foreseeable future, but do not appear to be affecting this population currently. Therefore, we conclude the threats to this population are not imminent.

__Yes__ Have you promptly reviewed all of the information received regarding the species for the purpose of determination whether emergency listing is needed?

Emergency Listing Review

__No__ Is Emergency Listing Warranted?

We lack certainty that the threats to the least chipmunk population in the White Mountains are habitat-based and could be addressed through emergency listing or section 7 consultation or both because we are not aware of any ongoing or proposed Federal actions in this area, either on the Mescalero Apache Reservation or the adjacent locality of Buck Mountain on the Lincoln National Forest. The White Mountains population is likely centered on Sierra Blanca Peak on the Mescalero Apache Reservation; however, we do not know the current population status of the Sierra Blanca Peak population because monitoring has not occurred since the 1980s. Additionally, the adjacent habitat remains intact on Buck Mountain. If it becomes apparent that the routine listing process is not sufficient to prevent extinction, then the emergency rule process will be initiated. We have contacted the Tribe in an attempt to survey the Sierra Blanca Peak population in 2012 to make a better assessment of the status of the subspecies. This information will be used to determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

Description of Monitoring:

Field surveys were conducted in 1981-1982, 1991-1996, 1998, 2000, and 2005-2007 (Frey and Boykin 2007, entire document; Hope and Frey 2000; Ortiz 1999) (please see information reviewed above under the Current Range/Distribution section, above). The most recent surveys in 2007 were conducted in the historic habitat of the Sacramento Mountains and White Mountains and no least chipmunks were found (Frey and Boykin 2007, pp. 47-48). The significance of not capturing any least chipmunks during this period is unknown (Frey and Boykin 2007, p. 50). It is possible that the subspecies was present but not detected because of its rarity, poor weather conditions during surveys, the earliness of the season and therefore low population numbers, or insufficient sampling effort (Frey and Boykin 2007, p. 50).

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

New Mexico

Indicate which State(s) did not provide any information or comment:

none

State Coordination:

NMDGF (2008) continued to classify the subspecies as endangered in 2008 due to their analysis of current threats. The subspecies is listed as imperiled in the New Mexico State Wildlife Action Plan's list of species of greatest conservation need (NMDGF 2006, p. 222). The New Mexico Department of Game and Fish was contacted and they reviewed this assessment. They previously provided survey data and status information and reviewed the assessment.

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Approval/Concurrence:

Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:



08/24/2012

Date

Concur:

11/06/2012

Date

Did not concur:

Date

Director's Remarks: